

Notice of Allowability

Application No.

09/786,254

Examiner

Carla Myers

Applicant(s)

BRENNER, SYDNEY

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed March 14, 2003.
2. ☒ The allowed claim(s) is/are 1, 3 and 5-8.
3. ☒ The drawings filed on 30 April 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.
5. ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892) | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____ | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other _____ |

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EXAMINER'S AMENDMENT

An amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it must be submitted no later than the payment of the Issue Fee.

Please cancel claims 9-16, non-elected without traverse in Paper No. 9.

Please insert the following sentence prior to the first line of the specification:

--This application is the National Stage of International Application No. PCT/US99/20047, filed August 31, 1999, which claims the benefit of U.S. Provisional Application No. 60/099,147, filed September 4, 1998.--

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**THE FOLLOWING IS AN EXAMINER'S STATEMENT OF REASONS FOR
ALLOWANCE:**

It is noted that the amendment to the claims to recite “heteroduplexes having at one terminus a region in which both strands are in single stranded form” is supported by the teachings of the specification at page 10 and Figure 1(c). In particular, page 10 of the specification teaches that “(p)artially double stranded structures (212) are rendered fully double stranded by treatment (220) with a DNA polymerase having 3'->5' exonuclease activity. Such a polymerase extends strand (137), cleaves the overhanging 3' end (149), then extends the same strand using region (192) as a template to form completed duplex (225).”

The closest prior art of Steffano teaches methods for detecting polymorphic DNA sequences wherein a reference DNA population is combined with a sample DNA population under conditions to allow for the formation of heteroduplexes between the reference and sample DNA; the heteroduplexes are treated with a 5' to 3' exonuclease which fully digests a single strand of the heteroduplexes which do not contain a mismatch, but does not fully digest heteroduplexes which contain a mismatch (i.e., a mismatch binding protein is bound to the heteroduplexes containing a mismatch and this binding protects the region containing the mismatch from exonuclease digestion), thereby isolating the mismatched heteroduplexes from the perfectly matched duplexes; amplifying the isolated mismatched heteroduplexes; and determining the sequence of the amplified mismatched heteroduplexes in order to detect and identify the presence of a polymorphism or mutation (see, for example, column 3, column 14 (lines 63-65) and Figure

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4). In particular, the method of Steffano requires the use of a mismatch binding protein to protect the region containing a mismatch from exonuclease digestion. The prior art does not teach or suggest the presently claimed methods for detecting a polymorphic DNA sequence wherein said methods specifically require that the heteroduplexes formed between the test and reference population have at one terminus a region in which both strands are in single stranded form (so as to prevent digestion from this terminus by an exonuclease that cleaves double-stranded DNA), treating the heteroduplexes with a exonuclease that cleaves double-stranded DNA, which results in the complete digestion of one strand of double-stranded DNA which does not contain a mismatch and only partial digestion of one strand of double-stranded DNA containing a mismatch, extending the partially double-stranded DNA, amplifying the resulting double-stranded heteroduplexes and determining the nucleotide sequence of the amplified DNA so as to identify a polymorphic sequence.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carla Myers whose telephone number is (703) 308-2199. The examiner can normally be reached on Monday-Thursday from 6:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703)-308-1119. Papers related to this application may be faxed

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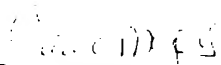
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to Group 1634 via the PTO Fax Center using the fax number (703)-872-9306 or (703)-872-9307 (after final).

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

Carla Myers

May 12, 2003


CARLA J. MYERS
PRIMARY EXAMINER